

NEWSLETTER

Quandong

WEST AUSTRALIAN NUT AND TREE CROP ASSOCIATION

April 1984 Vol.10 No.2*

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Stop press

GENERAL MEETING

MINISTER OF AGRICULTURE TO ATTEND

ALL MEMBERS URGED TO MAKE EVERY

EFFORT TO SUPPORT WANATCA.

See pp 7-10 for important
information.

MAY 1ST ND

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* See note on page 2.

*ERROR IN VOLUME NUMBERS OF 'QUANDONG'

An error occurred with the numbering of the last two issues of 'Qandong' for 1983. The third issue was numbered Vol.10 no.2 (should have been Vol.9 No.3) and the fourth issue was numbered Vol.10 No.4 (should have been Vol.9 No.4). Please correct the numbering on your 1983 issues of 'Quandong'. The correct numbering (Vol.10, Nos 1-4) will be applied in 1984.

MEETING DATES

* MAY 2 GENERAL MEETING *
 JUN 19 EXECUTIVE COMMITTEE
 AUG 1 GENERAL MEETING
 AUG 13-15 ACOTANC-2, MELBOURNE
 SEP 25 EXECUTIVE COMMITTEE
 NOV 7 ANNUAL GENERAL MEETING,

General meetings are held at the Naturalists Hall, Meriwa Street, Nedlands, at 7.30 pm on Wednesdays.

Members wishing any matter to be considered at an Executive Committee meeting should contact Lorna Budd at least 2 days before the meeting.

* The Minister for Agriculture will be attending the meeting on May 2nd. *
All members are urged to attend.

MEMBERS' CORNER

1. The WANATCA Yearbook

Preparations for the 1984 issue of the WANATCA Yearbook are now underway under the control of the current Editor, Lois Evans.

We are always on the lookout for accounts of members' experiences with nuts, fruits, and other tree crops - there is no way of substituting for local experience. Articles can be anything from a few paragraphs up to many pages in length. Please send your articles in - contact the Editor first if you wish.

After three years of valuable work, Lois has decided that 1984 will be her last year as Yearbook Editor; we understand that she intends to go out in a blaze of glory. For 1985 the Executive has offered the position to Dr David Turner, and we are very pleased to say that he has accepted.

Dr Turner is a qualified horticulturist on the staff of the Tropical Agronomy Unit at the University of Western Australis's Faculty of Agriculture. He has wide experience with tropical and subtropical fruit and nut crops, notably in Thailand. We hope to give more details later, meanwhile we welcome him to a more active role in the Association's affairs.

2. On SALE IN PERTH THIS SUMMER

The following new or unusual fruits have been on sale here recently:-

From ISRAEL: Fresh Figs (chilled and airfreighted);
\$6 - 9/Kg

From NEW ZEALAND: Babacos, \$6 - 9/Kg
Pepinos \$3 - 4 each
Blueberries, around \$3 /punnet
Raspberries, around \$3 /punnet

In addition, New Zealand continues its supplies of airfreighted AVOCADOS (competing with local fruit) and KIWI FRUIT.

From the PHILLIPPINES: Mangos, \$1.50 - 2.50 each

From MEXICO: Large red Mangos, \$2.50 - 4.00 each.

3. RECIPES

PECAN DATE TEA CAKE

Ingredients:

Cake 1½ cups flour, ½ teaspoon salt, 1/3 cup castor sugar, 60 gm butter, 1 egg, 2/3 cup milk.

Filling Squeeze lemon juice, ¼ cup chopped dates, ½ cup brown sugar, 2 teaspoons flour, 2 tsps cinnamon, 30 gm butter melted, ½ cup chopped Pecans, Pecans for garnish.

Method : Sift the flour, salt and sugar, add butter, egg and milk and stir well to combine. Pour half the mixture into a greased cake tin 20cm sq. Sprinkle over 2 or 3 tbsps of filling, then cover with the remaining batter. Sprinkle the reserved filling over the top and bake in a moderate oven for about 40 minutes or until cooked. Serve warm or cold.

Filling: Sprinkle lemon juice over the finely chopped dates then combine with other ingredients.

Send for — Free Del Cerro Pecan Recipes

To — Stahmann Farms Inc. P.O. Box 481, Redcliffe, Qld. 4020

NAME

ADDRESS

..... POSTCODE

Recipes cont.

THE CHESTNUT

SAVOURY RECIPES

Chestnut lend themselves to a great many savoury dishes, which are sufficient to make up a complete meal by themselves. Besides being used for stuffings (turkey stuffed with chestnuts and sausages is excellent) above all you can obtain simple and savoury soups, for the most part of country origin, but so delicious as to be able to take their place on an important menu: even for Christmas dinner.

SOUP. Cook half a kilogramme of peeled and skinned or frozen chestnuts in two litres of broth together with 200 grammes of breadcrumbs. Pass them through a sieve and again put the « cream » on the flame with 50 grammes of butter and a small basil leaf. Cook for a further 10 minutes, stirring all the time, salt, pepper and serve in earthenware dishes with croutons fried in boiling oil.

WITH LEEKS. In oil and butter brown 4 - 5 nice leeks, two sticks of celery and a bunch of parsley, all finely chopped, together with a clove of crushed garlic, which should be eliminated as soon as it is golden. Add to the mixture half a kilo of peeled, skinned or frozen chestnuts and about half a litre of water. Salt and pepper, bring to the boil and then let it cook slowly until the chestnuts are completely overcooked. Then pass the whole through the sieve and replace it on the flame with a little butter, adding some milk if the mixture is too thick. Serve with croutons browned in butter or else toasted in the oven.

STEW. Take 750 grammes of brozen peeled chestnuts, place them in a large shallow baking pan so as to form one layer only. Add a stick of celery and cover with cold water. Salt and put in also a level teaspoon of sugar. When the water begins to boil add thirty grammes of butter and a teaspoon of meat extract. Lower the flame and allow to simmer slowly until the chestnuts are well cooked, taking care that they remain whole.

PURÉE. Cook half a kilogramme of peeled and skinned or frozen chestnuts for about half an hour in broth or milk, together with a stick of celery, mixing with a wooden spoon. Then pass through a sieve or in a potato masher. Replace the purée thus obtained on the flame, salt and continue to stir it for a further ten minutes together with 50 grammes of butter, adding broth or milk according to the density required. Serve very hot as a vegetable dish with boiled or roasted meat, chicken or game.

WITH BREAD AND BACON. In a large shallow saucepan place alternating slices of lean bacon, half a kilogramme of peeled and skinned or frozen chestnuts, three onions and four finely sliced carrots. Add a stick of celery, chopped, and a bay leaf. Salt and pepper. Pour on the whole a glass of broth and one of white wine. Cover and simmer on a low flame for more than an hour, occasionally adding more broth if necessary. In the meanwhile fry some slices of crustless stale bread in the butter. When the chestnuts are well cooked, mash them roughly with a fork directly in the saucepan, together with the other ingredients. Now place a layer of fried bread on the bottom of a pyrex dish, add a layer of chestnuts and bacon; then

one of bread, then another of chestnuts and cover the whole with a final layer of bread, sprinkling it with grated Parmesan cheese. Damp with the cooking liquid and cook « au gratin » in a very hot oven. Serve immediately.

WITH PUREE (OR WITH THE PASTE)

Here are some « seasonal » sweets using the purée obtained from passing the chestnuts cooked in milk, sweetened or not, through a sieve.

MONTEBIANCO. In a covered saucepan allow to cook on a slow flame for about 45 minutes a kilogramme of peeled and skinned chestnuts, just covered in milk in which a pinch of vanilla has been dissolved. Drain the fruit, pass through a sieve and mix with fine sugar (of a weight equal to half that of the chestnuts). Put the purée again on the flame and stir it for a few minutes still, so that it becomes thick but fluffy. Let it cool, then pass the mixture through a sieve with very large holes or through a potato masher, placing the vermicelli thus obtained directly onto the serving dish and giving the whole a conical shape. Prepare the whipped cream with half a litre of milk cream and three spoons of sugar and cover the cone, using the blade of a knife. Keep the sweet in the refrigerator until the last possible moment and serve it decorated with candied violets (the dose is for 8 persons).

IN THE ROLL. Cook a kilogramme of peeled and skinned or frozen chestnuts, pass them through a sieve and work them with half a glass of hot milk and a liqueur glass of Strega, so as to obtain a soft but consistent paste. Spread it on a tinfoil sheet (or greasoproof paper) giving it the shape of a disc. Spread abundant apricot jam on the disc and roll it delicately on to itself. Spread a little more jam on the roll and cover it with a handful of almonds and chopped pistachio nuts. Keep it in the fridge until the last moment. Serve it in slices.

WITH COCOA AND COFFEE. Purchase two jars of chestnuts purée. Mix the contents of one jar with 200 grammes of cocoa powder dissolved in a little water. Line a mould with greaseproof paper and place alternating layers of plain purée and cocoa purée. Put the mould in the freezer for a couple of hours to set the sweet well. Then pass it into the normal compartment of the refrigerator until the moment of going to table. In the meantime you will have prepared a coffee cream. Beat two egg yolks with 50 grammes of sugar and a decilitre of strong coffee and let it cook bain - marie until the cream becomes very thick. Let it cool and fold in a quarter of whipped cream and a spoonful of bitter chocolate flakes. At the moment of going to table remove the sweet from the mould and cover it accurately with the coffee cream.

WITH CHESTNUT FLOUR

CASTAGNACCIO. Work 300 grammes of chestnuts purée with a very little warm water, a spoonful of oil, one of sugar and a pinch of salt so as to obtain a rather thick mixture. Fold in a handful of pine seeds and of fennel seeds. Oil a large shallow baking tin and pour the mixture in a layer not higher than a couple of centimetres. Brush the surface with a little oil and sprinkle it with a pinch of rosemary. Put it in a very hot oven for about 45 minutes, taking out the castagnaccio as soon as it becomes a nice dark colour and has a crispy crust. Leave it to cool in the tin itself and serve in slices.

LETTERS

1984 February 14

The Hon. H.D. Evans, Minister for Agriculture
9th Floor, 172 St Georges Terrace
Perth WA 6000

Dear Mr Evans

Tree Crop Research in W.A.

I am writing to ask for your help in two matters relating to research into tree and nut crops in Western Australia. You will be aware of the increasing development in this area, particularly with non-traditional fruits and nuts. Figures released by the Bureau of Statistics show that during the past six years, there have been very large increases in the plantings of some tree crops. For nut trees of all sorts, the increase has been over 340%; of these, chestnut plantings were up 370%, and pecan plantings up 2410%, over 25 times as many as six years previously. Mangos are up 1410%, and some of the other newer fruits being actively planted have no statistical comparison as they scarcely existed in W.A. six years ago.

On the other hand, plantings of traditional fruits have declined. Typical figures are; apples down 20%, oranges down 26%, and grapefruit down 41%. I think these figures demonstrate that the tree crop industries are in a state of considerable flux, where the traditional recipe of sticking with what we know from old is a recipe for inevitable decline.

The increased plantings of non-traditional tree crops are an encouraging start, but they barely scratch the surface of the potential available in W.A. Some time ago, we were visited by Mr Henry Esbenshade of California, President of the International Tree Crop Institute. He travelled all round the State, including the tropical north. When he came back to Perth, he told me that in his opinion, Western Australia has all the potential to become one of the major food baskets of the world. And this from someone from California, which has an annual tree crop value around \$3000 million, a hundred times our present level!

Naturally, in this situation, much thought and development must be applied to the introduction and marketing of suitable tree crops. Such work is already proceeding in W.A., but typically on a small and haphazard scale. Moreover, much of this work appears to be in the hands of private individuals, with the Department of Agriculture appearing to maintain a low profile, with few staff involved and advice and services offered largely restricted to the backyard gardener level.

Of course, it may be that work is going on on these topics in your Department, but that this work has not been publicised. The Executive Committee of this Association has discussed the matter at some length, and have concluded that either the Department is putting hopelessly insufficient work into the tree crops area, or is poorly publicising the work it has done, or both. This is in no sense a criticism of the able staff which you have working in our area, it is more that the staff which exist are spread far too thinly to be at all effective in fostering the development of a major exporting branch of agriculture. A comparison with what, say, the New Zealanders have done with tree crops shows us up in a very poor light.

To come to the first request, a fairly easy one. The Executive Committee have asked me to invite you to address the members of our Association, and some kindred organizations, at our next meeting, on the topic of "Department of Agriculture Involvement in Tree Crop Research in W.A.". This meeting will be held on the evening of Wednesday, May 2, at Nedlands. We appreciate that the time of a Minister of the Crown is very limited, but we feel that the matter involved is one of great importance in the long-term prosperity of our State.

The second request is more far-reaching, and can be presented here only in a tentative, exploratory form. For some years now, our Executive has been keen to see the creation of a more formal body than ours, along the lines of a Tree & Nut Crop Research Foundation. We have some minor research projects ourselves, for example on tissue-culture propagation of pistachio nut trees, but the amount of this which can be funded from annual membership fees of a few dollars per head is strictly limited. I have therefore been asked to approach you to ask whether your Department would wish to be involved in moves to set up such a research foundation.

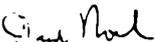
Naturally, everything in this area is still extremely fluid, but one proposal which comes to mind is that your Department might provide physical facilities for such an organization -- office space, secretarial help, and the like. In this case there would be no specific call on Departmental funds, but more an extension of your existing facilities to members of the new Foundation. In this connection, you may know that our sister organizations in Victoria and Tasmania, the Victorian Nut Growers' Association and the Tasmanian Nut Growers' Association, are run entirely from within their respective Departments of Agriculture.

We would still see the Foundation as a legally independent body, and there are many advantages in this. An independent body has prospects of attracting funding from private individuals, public companies, and certain national and international bodies, whereas, as you will have noticed, no-one is especially keen to hand over money 'to the Government'. Moreover, an independent body is able to put out publications and make recommendations which may be somewhat more controversial than those of a necessarily more restricted government department.

Our Association does not see itself as 'running' such a foundation, but more as an active participant in the setting-up stages, and with a representative on the Board of Management. We would anticipate other representatives sitting on behalf of your Department, and possibly other Government departments such as Forests, together with representatives of interested Associations and research groups (eg university and college departments of horticulture). In the initial stages, we may be able to provide some part-time staffing, and we would be willing to 'hand over' existing research projects such as the pistachio project mentioned above. We can also offer access to extensive specialized literature, not held in your Department's library, and access to a number of specialists within W.A., Australia, and overseas.

Whatever the outcome of these two requests, we hope that we may have the continued interest of the Minister in all Departmental matters where tree crops may be involved. This would include staffing levels, the interests of potential appointees to senior Departmental positions, funding levels, and trade value considerations.

Yours sincerely,



David Noel
President



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Minister for Agriculture

Mr D. Noel
President
West Australian Nut and Tree
Crop Association
P.O. Box 27
SUBIACO WA 6008

-8 MAR 1994

Dear Mr Noel

TREE CROP RESEARCH IN WESTERN AUSTRALIA

Thank you for your letter of February 14 and the invitation to address a meeting of your Association on May 2.

I suggest that Mr Jim Fallon, Chief of the Division of Horticulture of the Department of Agriculture should address your meeting, but I would be pleased to be present to hear your views. If this is suitable, I will arrange accordingly.

I was interested to read your Association's proposal for establishing a Tree and Nut Crop Research Foundation and would like to see the concept developed further. While the figures quoted in your letter indicate a marked increase in the area of non-traditional fruits and nuts, the total area planted and its value is still small in comparison to traditional tree fruits.

Despite a decrease in the area of some of the traditional fruits, research and developments in cultural technology (e.g. closer planting distances) have enabled higher and more economic production per hectare. Technical information is conveyed to growers through the Department's Farmnote series, Agricultural memos produced by district extension officers, field days at research stations, etc. Some of the information is also applicable to non-traditional crops.

The Department does recognise the need to examine alternative crops and where resources allow, some research is undertaken. Avocados, Pecans, Pistachios, Chinese Gooseberries and Mangoes are crops being evaluated. I understand your Association has printed material produced by some of my Department's officers and some officers have also addressed your Association. However, from your letter, it appears that your Association considers it is not getting the full benefit of resources available from the Department.

- 2 -

With traditional fruit crops there is a system of industry involvement in directing research priorities. Research projects are suggested by district fruit growing organisations and specific crop committees, such as the Stonefruit Committee of the Western Australian Fruit Growers' Association. The suggested projects are carefully evaluated by the Department's Fruit Research Working Party which sets priorities within the limits of available staff and facilities. Programmes are then presented for ratification to the Western Australian Fruit Advisory Council which has representatives from growers, Department of Agriculture and exporters. These committees also play an important role in the dissemination of research results.

I agree that a similar system of liaison and consultation could be established for alternative crops through a Research Foundation. The Research Foundation would, perhaps, make recommendations on research priorities to the Department's Fruit Research Working Party which would evaluate them along with proposals for traditional tree fruits. The Research Foundation could also serve as a distributor of research results. If the Department cannot undertake all recommended research projects, then provided private industry funds are available, the Department could take on, under contract, a research officer for the specific project.

On the matter of Department of Agriculture involvement and the use of Department facilities for a Research Foundation more detail of the proposal would be needed to enable it to be considered. If your executive wishes to pursue the idea, it is suggested that representatives might be nominated to meet with officers of my Department. In the first instance, contact could be made with the Chief, Division of Horticulture, Mr Jim Fallon, to arrange a convenient time.

Yours sincerely



H.D. EVANS, M.L.A.
MINISTER FOR AGRICULTURE

Tropical fruit acreage fetches exotic prices

By NIGEL AUSTIN

LAND booms, part and parcel of rural Australia since first settlement, are usually caused by a shortage of prime agricultural land for a particular purpose.

This is exactly the situation on the lush, red soil country of the Alstonville Plateau in the north east corner of NSW, north of the flourishing Lismore township.

Land prices have escalated from a low of \$370 a hectare, back in the 1960s when the district was nothing better than a struggling dairying area, to prices of \$6000 to \$10,000 a ha.

Wealthy city businessmen have poured untold millions of dollars into exotic fruit growing in the district with crops like macadamia nuts, avocados, mangos, lychees, sapodillas and carabolas.

Demand for land has been based on the almost sudden realisation that the district contains the only pocket of land ideal for growing tropical and sub-tropical fruits in NSW and possibly the best expanse of such land in Australia.

The land boom is also caused by the increasing desire of city

In The Country

people to leave the rat-race and get away to peace and quiet and also of those seeking alternative lifestyles.

Typical of the mammoth prices is an offer of \$550,000 one leading north coast real estate company, Wal Murray and Co, has just made for a 40ha block for a client.

Doubled

Lismore managing director of Murray and Co, Mr Graham Brown, says prices started rising for this prime fruit growing country about 10 years ago and have since risen in leaps and bounds.

Mr Brown believes this is the best tropical fruit growing area in the world and also the best area to live in Australia.

"There is not a lot of land left for sale, but there is enough to meet demand. Farmers are slowly releasing grazing country because most agricultural pursuits can be carried out more profitably elsewhere," Mr Brown said.

"Prices almost doubled for tropical fruit country in 1979-

1980 and are still rising today. Buying tailed right off during the recession, but the buyers are now coming back in droves."

Mr Brown said buyers were mainly from Melbourne and Sydney, but also came from all parts of the nation.

One of the most expensive exotic fruit properties sold by Wal Murray and Co in 1983 was a 24ha block which went for \$450,000 to the Sydney business firm, R. Rawlings and Co.

The property, including an 8ha avocado plantation with an annual income of \$100,000, was sold on behalf of Mr D. Raverty.

Mr Brown said a typical example of the profits from growing exotic fruit was a 24ha farm on the Alstonville Plateau, used to grow avocados, macadamia nuts and lychees, which would break even after year nine.

If the property cost \$400,000 and had a net earning of \$200,000 by the 10th year its annual return on capital would be more than 20 per cent a year, based on conservative prices, he said.

An angry MP turned to

CAROL SIMMONDS gets the low-down on BILL WITHERS, politician turned worm farmer and owner of the Troppo Bar

BILL Withers is a one-time politician who got himself into a real can of worms when he left Parliament.

Actually it was a worm farm on the banks of the giant, man-made Lake Argyle at a place called Packsaddle in the remote Kimberley region of Western Australia.

The worms fertilise Mr Withers' fruit orchard which supplies his Troppo Bar Factory, from which he gets waste product to feed to his worms.

It is all a far cry from his days as senior cloud seeding officer with the CSIRO in NSW and an even further cry from Western Australia's Legislative Council.

It was politics that turned him to worm farming. "The whole thing was inspired by anger," he said. "I was mad at the Government not taking any notice of what I was saying about northern development."

"I wanted to demonstrate that people here could make a good living from farming if they looked at horticulture.

"I also wanted to show you could set up a manufacturing business in the Kimberley that would reduce imports and provide backloading to the south, thereby bringing down freight costs."

Mr Withers got his first worms — a bucketful — in Perth in exchange for a didgeridoo and a boomerang.

After transporting them to Packsaddle, about 3000km from Perth, he discovered they were not breeding. So he designed a worm breeder, the equivalent of an air-conditioned residence with all modern conveniences.

It worked. Mr Withers now has a "squillion" of them. They may not be much to look at — they are only about 40 per cent of the length of worms down south — but they fertilise the orchard, provide good food for the chickens, and make a great vegetable garden.

Mr Withers eventually hopes to sell the surplus fertiliser as potting mix. At present he uses all the worms' produce on his orchard which supplies the Troppo Bar Factory.

Speciality

The Troppo Bar is his own creation. It is an ice confection made entirely of fruit without artificial anything. The unique product has already won "export" markets to Perth and may soon be sent overseas.

Mr Withers likes to thumb his nose at bureaucrats and governments, such as when he built his farmhouse.

He started with two steel farm sheds made to his design, put the roof up first so he would be working in shade while he finished the job, built brick walls inside and water-



BILL WITHERS . . . his cyc

washed river cobblestone walls on the outside.

With all the trimmings, it cost him about \$37,000 compared with the average State Housing Commission bill of \$75,000, and it has since been valued at \$136,000.

"I believed housing could be designed and built cheaper than State Housing and I proved that even beyond my expectations," he said.

He says the trouble with bureaucrats and politicians is that too many live down south, from where they cannot know what it is like to live in the north west.

He went into politics in 1971 to help fill the void, but resigned 10 years later.

The final straw had been the then State Government's deci-

Bill Withers joined WANATCA in 1982

worms



lic industry turns on worms

sion to impose the one man, one vote, one value system in the two Legislative Assembly seats in his Upper House electorate.

"The Kimberley seat is 85,000 times larger than metropolitan Scarborough and has only 14 per cent fewer electors," he said. "There is far too much of an imbalance in representation."

Next month Mr Withers and his wife Judy celebrate 20 years in the Kimberley and their 30th wedding anniversary.

"The Kimberley is such an exciting place," Mr Withers said. "You can do things here you just can't do in the city, like starting up a business while living in a tent."

"It is a place where there are a lot of dreams."

Graziers cautious over find

THE GRAZING industry was cautiously optimistic yesterday that a technological breakthrough by the Commonwealth Scientific and Industrial Research Organisation could signal a new

lease of life for the ill-fated Ord River scheme in the North.

The breakthrough involves the plant *Leucaena Leucocephala*, a native of Hawaii and some South American countries. It has enormous potential as a food for ruminants such as cattle.

"The results are so far very promising," said Mr Norm Halse, director of the WA Department of Agriculture.

"We are testing the new findings of the CSIRO in the Ord River area on an extensive scale.

"The reserach could lead to the establishment of profitable, irrigated pasture development on the Ord River, integrated with the use of dry range land."

The plant, which is a tall brown shrub not unlike a small wattle tree, has a high protein content. It has been the subject of an intensive CSIRO research project for more than five years.

The breakthrough involves the discovery of anaerobic bacteria which, if introduced into the cattle, allow them to safely digest big quantities of the *leucaena* plant.

However, Mr George Savell, deputy director of the Pastoralists and Graziers' Association of WA, said that the successful introduction of the plant would depend on high cattle prices to cover the big infrastructure costs of irrigation, meatworks and transport.

GRAFTING OF HAZELNUTS

Graeme E Thomson

Horticultural Research Institute

Victorian Department of Agriculture

Burwood Highway

Knoxfield 3160

INTRODUCTION

Conventional grafting of hazelnuts (Corylus avellana) rarely achieves better than 10% success. Recently a new technique of hot-callusing has been developed which exposes the union to elevated temperatures but not the remainder of the plant (Lagerstedt, 1981). An optimum level of heat around the graft union promotes rapid and prolific callus development without premature scion bud burst. Lagerstedt (1982) reports up to 100% success with hazelnuts using this technique. The present study examines the success of the new hot-callusing method at different times of the year with varying heat applications.

MATERIALS AND METHODS

Preparation of Plant Material

All grafting was conducted in a shadehouse using 'White Aveline' as stock and 'Kentish Cob' as scion wood. Grafts were of the whip type and unions were secured with translucent polyethylene tape without wax.

Scion wood about 12 cm long and with 2 buds was selected from the basal and middle regions of latest growth. Stocks with well developed root systems were chosen and cut to a height of 25-40 cm. Stock and scion diameter varied from 0.7-1.0 cm.

Hot-callusing Pipe

The 'hot-callusing' pipe has been designed to house graft unions and heat the air surrounding them. Heating promotes callus development and healing while the rest of the plant remains at ambient air temperatures. During winter, the cooler ambient temperatures restrict the development of scion buds and prevent the early burst and scion desiccation that will occur if the whole plant is placed in a heated environment.

The callusing pipe consisted of a 3.3 m long, 5 cm diameter PVC pipe housing an inner pipe (1.6 cm diameter) containing thermostatically controlled electric heating cables and water. The heated inner pipe maintained air temperatures surrounding the union in the larger pipe at $27^{\circ} \pm 2^{\circ}\text{C}$. The water aided in reducing temperature fluctuations caused by the natural environment. To help prevent the escape of heated air, strips of foam rubber were firmly positioned over the slots and unions.

Grafted plants were laid perpendicularly across the pipe with each union contained in a cut slot (1.2 x 4.5 cm). One hundred plants could be accommodated and root systems were covered by a soil-sawdust mixture to prevent desiccation. Unions were assessed after 4 weeks.

RESULTS

Standard grafting techniques gave poor results with hazels, however, the new hot-callusing method increased take to over 90% (See Table). The success of this hot-callusing treatment was dependent on

environment and wood maturity. Best results were obtained in winter using dormant hardwood. Buds of stored scions grafted in October burst in the warmer air and scions dried out before unions had developed sufficiently. Sweating and failure of unions may result in the callusing device if there is not some air flow around unions.

REFERENCES

- Lagerstedt, H. B. (1981). A new device for hot-callusing graft unions. HortScience, 16(4), 529-530.
- Lagerstedt, H. B. (1982). Three promising filbert propagation techniques. Proceedings Nut Growers Society of Oregon, Washington & British Columbia - Growers handbook, 58-66.
- cuttings. Plant Propagator, 19(3), 20.

Time of grafting	Weeks at 27 ⁰ ± 2 ⁰ C	Stock	Scion	Percentage Successful Take*
July	0	Dormant hardwood	Dormant hardwood	7 d
July	2†	Dormant hardwood	Dormant hardwood	70 b
July	4	Dormant hardwood	Dormant hardwood	93 a
October	4	In leaf	Dormant, stored (1 ⁰ C, 11 weeks) hardwood	43 c
January	0	In leaf	Semi-hardwood leaves removed	10 d
January	4	In leaf	Semi-hardwood leaves removed	10 d

HAZELNUT GRAFTING TRIALS

'White Aveline' stocks with well developed root systems were whip grafted to 'Kentish Cob' scions about 12 cm long. All unions were assessed 4 weeks after initial grafting and heat treatment was applied via a 'hot-callusing' pipe. n = 30

† Initial 2 weeks of 4 week period

* Numbers followed by a different letter are significantly different, as indicated by Chi square test, p = 0.05

Trials, Tribulations, and Success of Growing Kiwifruit at Mar Vista Ranch and Nursery

Horace Whittaker

In 1972 we decided to investigate the possibility of growing Kiwifruit at our avocado ranch in Carpinteria, ten miles south of Santa Barbara. That fall when I was in Chico, Ca. I went out to the U.S.D.A. Agricultural Introductory Station to talk to Robert Smith, who was in charge of Kiwifruit introduction. After discussing our location and what was grown here, Mr. Smith thought we could grow Kiwifruit. Before leaving Chico I ordered 50 grafted plants for Spring 1973 delivery.

The next spring we cleared enough brush from a steep hillside to plant the Kiwi, installed a watering system and trellises. The 50 small, grafted plants were planted in late spring and started to grow. That fall we decided to expand our planting and ordered 200 seedling Kiwi for early 1974 delivery. More hillside was cleared, watering system and trellises installed, and 200 small Kiwi planted. In 1975 we completed planting all the unplanted land we owned with 150 more seedling Kiwi. We also had all the seedling Kiwi grafted to the 'Hayward' variety, which was the only variety recommended at that time. The same year we had our first few fruit off the original plants we had planted in 1973. In 1976 we had more fruit, and two of our 1974 (grafted in '75) plants had fruit (± 20 each vine).

Then we started to have warm winters. Prior to 1976-77 we had a long series of cold winters, when many nights the neighbors' wind machines (used to prevent frost damage), which come on at 34-35° F, would run all night. Starting in 1976-77 and until now, except in 1978-79, we have had winters with little or no wind machines operating. With warm winters we had a very drastic decrease in fruit production in spite of the increasing size of the vines. The '79 crop was an exception due to the '78-79 very cold winter.

Search for Low-Chill Varieties

After taking early retirement, in order to have more time on our ranch, I decided to try other Kiwi varieties which have been selected in New Zealand and California, to see if these varieties would produce fruit with less chill than the 'Hayward.' In the winter of '78-79 I obtained some scion wood of the 'Vincent' variety from Judge Raymond Vincent at Yorba Linda; also scion wood of the 'Monty,' 'Abott,' and 'Bruno' varieties from Jud Ingram, an early pioneer California Kiwi grower and nurseryman. These were grafted onto some of the '73 and '74 Kiwi vines. I also installed a continuously recording thermometer so I could determine the hours of chill at this location (chill is the hours below 45° F minus any hours above 60° F on the following day). Since installing this recorder the hours of chill have ranged from 0 to ± 100 hours, except '78-79 which was ± 600 hours.

The year after grafting, these grafts started to produce fruit, while the remaining 'Hayward' plants had very little fruit. In 1982 we had 'Vincent' grafted vines with as much as 500 lbs. of fruit. The best 'Hayward' vines had under 100 lbs. and many had less than 10 lbs. However, the 'Vincent' vines had so

many fruit that most were quite small. We are now trying various means to reduce the number of fruit so they will be a larger size.

In the fall of 1980, while on an agricultural study tour, we found some Kiwifruit vines growing in the Canary Islands. Upon inquiry we found that they had one plant of a 'Hayward' seedling which was producing fruit there. This plant was the first to blossom in a group of seedling plants of the four main varieties grown in New Zealand. Normally, 'Hayward' variety plants are the slowest growing of all varieties and should be the last to blossom. At the location of this plant the average low temperature is 9° C (49° F). This plant produced 80 lbs. of fruit when eight years old.

We arranged to trade scion wood. I sent some scion wood of the 'Vincent' variety and they sent wood from their seedling 'Hayward,' which they had named 'Tewi' (Tenerife Kiwi). This 'Tewi' wood was grafted on three 1974 rootstocks in February '81. It also turned out to be a precocious grower and one plant filled 24 ft. of trellis the first year, and also produced a large number of lateral growths. In 1982 this plant produced about 50 lbs. of fruit which was very similar to the 'Hayward' variety. It is a larger fruit than 'Vincent' but smaller than 'Hayward.' It has the same brilliant green interior color of the 'Hayward,' whereas the 'Vincent' has a very slight yellow cast to the green.

We are now doing a more complete evaluation of 'Vincent,' 'Tewi,' and a selected 'Hayward,' which we call 'Mar Vista' Hayward. We were losing about 1½ acres of avocados in a separate area which faces south to root rot (*Phytophthora cinnamoni*) and in 1980 we started planting Kiwi vines in this area. At the bottom of this area, the coldest location, we planted 'Mar Vista' Hayward, above them a block of 'Tewi,' and the top area to 'Vincent.' The plants we used were all cutting-grown 'Hayward' grown here, and these were grafted to the desired variety. Results of this evaluation will be reported a few years from now.

Investigating Kiwi Propagation

In 1976 I decided to see if I could root some of the dormant wood which has to be pruned off each year. I wrote to the Dept. of Pomology at U.C., Davis, where research on Kiwifruit is conducted, and received a letter from Dr. Beutel, the field research pomologist for Kiwifruit, with directions for rooting cuttings. The procedures I use are based on Dr. Beutel's instructions and the book, "Plant Propagation – Principles and Practice" by Hartmann and Kester. This book was recommended by Paul Thomson in an early Quarterly CRFG Newsletter and I also highly recommend it.

Following Dr. Beutel's directions as closely as I could, I had about 40% rooting the first year. The next year only 15-20% rooted, and the third year only about 5%; all were in new media each year, but not in the same physical location. All loss was due to growth of the top bud(s) before roots had formed. From hindsight, I can see that the first year the cutting bed was in a very cool location, and that the following years the beds were in warmer locations.

In 1980 I tried a method described in "Plant Propagation" in which the treated cuttings are placed upside down in rooting media to callus and form roots. They are then planted in potting media right side up. The first year this worked well with 60-70% rooting. The following year only about 30% rooted,

using the same method and location. I then decided (1981) to try some summer cuttings and installed the necessary equipment. This procedure worked well for female cuttings, with 80-85% rooting, but only 15-20% of the male cuttings rooted. The following year was equally successful and again only 15-20% of male cuttings rooted.

We have found that the 'Vincent' variety root much better than any other variety. The 'Tewi' probably roots more readily than the 'Hayward' but we do not have much experience as yet with the 'Tewi.' We will know more after this year.

Rooting Cuttings

Kiwifruit (*Actinidia chinensis*) can be reproduced from stem cuttings, both dormant hardwood in winter and semi-hardwood in summer, but not easily. However, I have had the most success with semi-hardwood summer cuttings. To make summer cuttings you will need:

(1) Cuttings of Kiwifruit wood with two or three nodes and $\frac{3}{8}$ - $\frac{1}{2}$ " in diameter. These can be taken from mid-May through June. Cut the wood $\pm \frac{1}{4}$ - $\frac{1}{2}$ " above the top node and below the bottom node. Remove leaves from all but the top node. Reduce size of top leaf to about 3-4" diameter. I wound the bottom node by cutting away about half of the node, as this may help rooting. The cuttings should be taken from the vine, prepared for rooting, and placed in rooting media as quickly as possible to reduce wilting of leaf.

(2) You will need to treat the basal end of the cutting with a growth regulator, since Kiwi cuttings do not root readily without treatment. I use a quick dip (± 10 sec.) in a ± 6000 ppm. solution of Indol Butyric Acid (IBA) in 50% ethyl alcohol. (This can be prepared by adding $\pm \frac{1}{2}$ tsp. of IBA¹ to 2 $\frac{1}{2}$ oz. of 70% ethyl alcohol (rubbing alcohol) and 1 oz. of distilled or deionized water). A conifer-type rooting compound (± 8000 ppm. IBA in talc) can also be used, but it is not as effective as a quick dip.

(3) A well-drained sterile medium is required for rooting the cuttings. I use a well-mixed combination of 25-30% peat moss (Canadian) and horticultural perlite ($\pm \frac{1}{8}$ - $\frac{1}{4}$ size). The cuttings are inserted 1-2" into the media. I use individual plastic pots (2-3" size) to prevent transmission of fungus disease between cuttings. A 3-4" deep cutting bed can be used. The cuttings should be shaded from direct sunlight. I try to maintain 2,500-3,000 foot candles at mid-day on the cuttings, which is about one-third of direct sunlight.

(4) Bottom heat is required to produce rooting of the cuttings. I use electric resistance heating cable controlled by a remote bulb thermostat². I insert a mercury thermometer in the medium to check the temperature, which is maintained at $\pm 75^\circ$ F or above.

(5) Some method of preventing drying out of the leaf is necessary. I use an intermittent mist system. This requires a 24-hour time clock, a 5- or 10-minute cycle timer, a 24 volt transformer, a 24 volt solenoid valve, and mist nozzles³. For a few cuttings I believe a transparent enclosure placed over the cuttings should accomplish the same end. If the cuttings are enclosed, place them in full shade, since direct sunlight would cook the cuttings from the greenhouse effect.

The cuttings should have sufficient roots in six to eight weeks to plant in soil. When planting the cuttings in soil, remove all rooting media above the root mass and plant so top of roots are flush or slightly above soil level, and soil slopes away from stem of cutting. This is to prevent crown rot, to which Kiwi plants are very susceptible. I plant directly from rooting bench into growing container, a 7" x 16" plastic sleeve. I use a soil mix of \pm 60% very sandy soil, 35% nitrogen treated saw mill wood waste, \pm 3% aged manure, \pm 2% used rooting media, 4-5 lbs. of dolomite lime per yard of mix, and 5-6 lbs. of a mixed fertilizer (16-4-7 plus iron and zinc) per yard. To prevent crown rot the stem of the cutting is painted with a 50/50 mixture of Bordeaux (12½%) fungicide with interior vinyl paint and the mixture diluted with water, to a very thin consistency.

To make dormant stem cuttings you need:

- (1) Stem cuttings of dormant wood, ¾-½" in diameter, with two or three nodes. These can be taken from mid-December to mid-February. Cut the wood \pm ¼-½" above the top and below the bottom nodes.
- (2) You will need to treat the basal end of the cutting the same as for summer cuttings.
- (3) The treated cuttings are placed in the same type of medium as used for summer cuttings. They are placed over bottom heat (\pm 75° F) in a cool location where the tops can be kept cold (45-50° F). This is to prevent growth of the top node(s) before roots develop, which requires six to eight weeks. If growth starts before roots develop the cutting will die. A cold basement or something similar is necessary to root dormant cuttings.
- (4) Rooted dormant cuttings are treated the same as summer cuttings.

Sources

¹ IBA — Indole — 3 — Butyric Acid.

Baker Chemical Co. # N 901 5 gms. Obtainable from chemical supply companies or larger farm stores.

² Heating cable and remote bulb thermostat.

Obtainable from California Greenhouse Controls Corp. 3266 N, Rosemead Blvd., El Monte, CA 91731. (213) 280-2543. My thermostats were obtained from W. W. Grainger, Inc., who has stores all over. The heating cable is actually vinyl-coated ceiling home heating cable.

³ 24-hour time clock, cycle time, solenoid valve and mist nozzles. All of these may be obtained from W. A. Westgate Company, Inc., P.O. Box 445, Davis, CA 95616. (916) 753-2954.

Another Experience with Kiwi Cuttings

Bill Barry, 39060 Calle Breve, Temecula, CA 92390, has written us about his preferred approach to Kiwi cuttings. Among the several methods he has tried, he says the best results came from rooting male cuttings and then grafting female scions on to them. According to Barry, the plants were far more vigorous than vines from other propagation methods. Now we'd like to know something about the fruit.

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Pepinos

A new variety of fruit, which is ideal for home gardeners, has recently been released by Wayfarer Nursery at Peats Ridge, N.S.W.

Called Pepino 'Wayfarer Special', this dwarf shrub produces mango sized bright yellow fruit which taste like rockmelon, with a hint of pineapple.

Full grown, Pepino 'Wayfarer Special' is a mere 1 m tall and about 1½-2 m wide, making it ideal for even the smallest garden. This variety is long-lived and has shown reasonable frost-hardiness as well as very rapid growth. Fruit can be harvested as little as 3 months after planting and the plants continue to fruit for 4-5 years.

The fruit keep well, usually around one week in a household fruit bowl or around four weeks if kept chilled (around 10°C).

Queensland growers have been promoting the variety 'Pepino Gold' for some time now, and it is felt that Pepinos have a huge future on the Australian market.

Fruiting occurs primarily in the warmer months, although, once established, Pepinos flower and fruit almost continually.

Seedling Pepinos are very variable in taste and fruit-setting ability but Barry Leverton, owner of Wayfarer Nursery says that his variety has excellent flavour and fruiting characteristics.

According to Mr Leverton, this variety was tested in New Zealand at the Levin

Horticultural Research Centre, where it produced yields four times greater than those reported elsewhere in the world.

The plant was released at the NSW Association of Nurserymen's February Market Day and featured a fruit tasting for better assessment of the plant's future.

Pepino is a Spanish word meaning cucumber, but has become the most common name for this plant. Botanically it is known as *Solanum muricatum*. The pepino comes from the temperate Andean regions of Chile, Peru and Columbia.

Pepinos are prone to a number of pests, notably red spider and snails, requiring similar treatment to that for tomatoes in the home garden. They are also prone to white fly and caterpillars as well as potato blight.

Like any fruit or vegetable, they require vigilance against pests but the reward is both fast and spectacular.

Wholesale prices in Sydney during January for the fruit were \$20 per box of 12 fruits or \$1.50 per fruit! 

CHINESE JUJUBE PROPAGATION

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Chinese jujube cultivars (Zizyphus jujuba) are not so hard to propagate as the nationwide jujube shortage revealed in the pages of POMONA would suggest. I suspect the reason, jujube trees are unavailable now is because of the sudden increase in demand for the plant during the past 5 years. It takes nurseries several years to notice the demand for a new plant, acquire the starting plant material, work out a system for propagation, and get a supply of the finished product ready to sell. In the meantime, the nursery runs the risk that the public's fancy will turn elsewhere, leaving it with something it can't sell. Chinese jujubes are good enough and easy enough to grow that I don't expect the market for trees to disappear, though it could someday be oversupplied.

One problem in jujube propagation is the thorny rootstock. Several of the best scion cultivars (Silverhill, Leon Burk, Li, Lang) are almost thorn-free but all the rootstock one is likely to acquire would make a porcupine seem cuddly by comparison.

Jujubes can be whip grafted during late winter, but this has given me a low success rate. Chip buds or T-buds put in from late June through September give nearly 100% survival. I've put in over 500 buds during the past 10 years and averaged over 90% success. Jujube wood is exceedingly hard, and it takes a sharp knife to slice out a good flat-backed bud. Bud cutting is also complicated by the bends and curves that seem to occur at every bud site on the twig, and by the woody side branches that occur near many buds. I've stopped trying to force jujube buds the same summer I bud them in. Jujube trees go dormant unusually early in the fall, and newly-inserted buds seem inclined to rest. The following spring, just before dormancy ends, I cut the rootstock off just above the bud, and the bud usually breaks readily.

An alternative timing that might be more convenient is to chip bud just as the rootstock breaks dormancy in the spring. To do this, you have to cut budwood a few weeks before it comes out of dormancy. It stores well at 45°F. in a plastic bag so long as you can resist the urge to put something wet in the bag with the budwood. As soon as the union has formed, the bud can be forced.

As for growing the rootstock, there are 2 practical possibilities: Seed and root cuttings. Many jujube varieties produce

inviabile seed. Crack open their stones and you will find them empty. Other varieties produce an abundance of viable seed, although good seed production may require cross-pollination with a complementary variety. In any event, if you crack open the stones and there are plump kernels inside, chances are excellent that these will germinate. Cracked-out seed germinates faster and better than the seed left in the stone. Moist stratification of cracked-out seed at 45°F. for 2 months improves germination percent and seedling vigor.

Root cuttings are quite successful with Chinese jujube. This stands in marked contrast with stem cuttings, which are not impossible to root, but lie closer to that territory than a practical propagator will care to trespass. Most old jujube trees have extensive systems of roots that extend far out from the trunk just a few inches underground. If these roots are exhumed during late winter, cut into 4-inch long segments, and placed with 3 inches below and 1 inch above a peat-perlite medium, they will form new roots below and shoots above. These root segments have a right-side-up and an upside-down, and you have to stick them as though you knew which was which. Up is the end that was closer to the trunk of the tree. These root cuttings should be treated like hardwood stem cuttings. They may need shade or mist, depending on the temperature and humidity.

One disadvantage of rootstock obtained from root cuttings is that they will always lack a taproot. This makes the trees shallow-rooted and susceptible to toppling by wind or by the burden of a heavy crop. By contrast, seedling rootstocks have a taproot which gives them a better grip on the earth.

That's about it. Let me add without elaborating that of the 12 jujube cultivars I've tested for 5 years in north Florida, only 2 have been heavy producers so far. From what I've seen elsewhere in the southeastern U.S., I believe that jujube trees become more fruitful as they get older, but varieties that are highly fruitful in the dry southwest, even as young trees, disappoint you the first 5 years in the southeast. The varieties Silverhill and Leon Burk are the 2 that fruited heavily in years 3, 4, and 5 in north Florida.

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 Need to help winter injured plants? A spray of Urea or liquid fertilizer in early spring can give them a start. Use only small doses 1 Or 2 lbs. per 100 gal. on early leaves.

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